Asphalt Binder Cracking Device (ABCD) Inter-Laboratory Study

This document describes the general responsibilities of laboratories choosing to participate in the Inter-Laboratory Study of the Asphalt Binder Cracking Device (ABCD). This ILS will follow the guidelines of ASTM C802 "Standard Practice for Conducting an Inter-laboratory Test Program to Determine the Precision of Test Methods for Construction Materials" to evaluate the repeatability and reproducibility of ABCD. This project is part of the Highways for LIFE program and is partially funded by the U.S. Department of Transportation Federal Highway Administration.

Each participating laboratory will be provided with the equipment and asphalt binders required for the experiment. While the ABCD testing system is designed to be easy to use, each laboratory will be required to spend some time familiarizing itself with the operation of the equipment and procedures. User manuals, setup instructions, and detailed test procedures will be provided in advance so that each lab can be prepared when the equipment and sample materials arrive. Phone support will be available at EZ Asphalt Technology to answer questions. It is estimated that approximately 40 hours over a 2 week period will be required for each lab to familiarize itself with the equipment and procedures, setup, operate, conduct the test for the study, analyze the data, and then repackage the equipment for shipment. Participating laboratories would have an opportunity to keep the equipment a few days longer to test their own local materials. FHWA and EZ Asphalt would assist the state interpret the analysis of their local materials.

In general, each laboratory participating in this study will be responsible for the following:

1. Receiving and unpacking ABCD system weighing approximately 50 pounds. The system consists of a laptop computer and environmental chamber (see photo below). The asphalt binder samples will be shipped separately. At the conclusion of the work, each lab will repackage the system. Shipping costs may be the responsibility of the participating laboratory and are estimated at about $100 or less.

2. The ABCD testing system is a computer operated bench top system. Each laboratory will be responsible for supplying appropriate bench space or a table roughly 30" x 60" and capable of supporting approximately 60 pounds. The system requires 115v/60Hz/15A electrical source.

3. For ABCD sample preparation, each laboratory will be responsible for a heating oven capable of heating a 4-oz (120 ml) tin-can up to 170°C and a heat-gun or other suitable means to heat a spatula during specimen trimming. The laboratory will also be responsible for a water-bath or sink with running water to clean sample molds after each test.

4. Minor assembly will be required to setup the ABCD testing system. It is estimated that the setup will take approximately 30 minutes. Setup will include placing the ABCD

environmental chamber on the bench, placing the computer control on the bench, and connecting the data acquisition on the ABCD chamber to the computer control.

5. After the setup, the lab will then operate the system to determine the ABCD cracking temperature and strength of the asphalt binder samples shipped separately. The operator will prepare 4 ABCD samples per each supplied asphalt binder. The sample preparation includes heating and pouring the asphalt binder into 4 sample molds and trimming them after cooling down to room temperature. This ABCD sample preparation takes approximately 2 hours. Then, the trimmed samples are placed inside of ABCD chamber and the ABCD test is started. Depending on the cooling rate to be used, the ABCD test takes approximately 3 to 5 hours during which time the operator is free to do other tasks. After completion of the test, the sample is removed from the molds and the molds are cleaned with soap water and dried for the next test. Cleaning of 4 molds take approximately 30 minutes. The operator will run a data analysis program which will determine the cracking temperature and strength of each specimen.

6. Assuming one ABCD test per day, it will take approximately 40 person-hours or 10 working days over a 2 week period to complete the experiment including two practice tests. The data will be sent to the principle lab (EZ Asphalt) to be summarized and analyzed.

7. After the experiment asphalt binders have been tested, time will be allotted in the experiment schedule for each lab to analyze local materials, if desired.

8. After the sample material test is complete, the lab will repackage the system for shipment to the next participating laboratory. It is estimated that packaging for shipment will take approximately 30 minutes.

9. A questionnaire will be provided for each laboratory to comment on the equipment, operation, procedures, as well as its ILS participation experience.

10. Each lab will receive a copy of the final report.

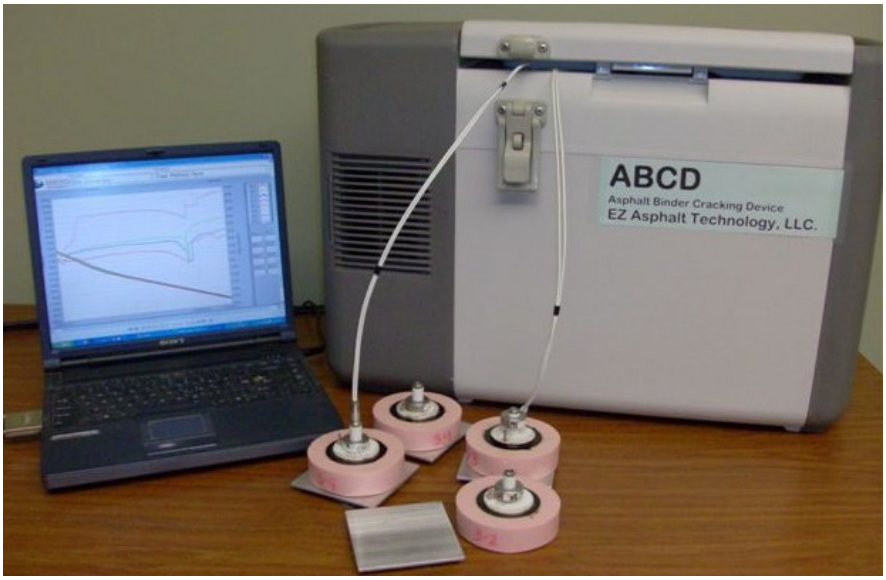

Figure 1. Asphalt Binder Cracking Device (ABCD): Computer control (left) and ABCD environmental chamber with four trimmed binder samples to be tested.

If interested in participating in the ILS study, please contact:

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